

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/965,204	SMEE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	George Eng	2643	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5/31/2005.
2. ☒ The allowed claim(s) is/are 1,3-9,11,14-25,27,28 and 31-35.
3. ☒ The drawings filed on 25 September 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. <input type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br/>Paper No./Mail Date _____</li> <li>4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br/>of Biological Material</li> </ol> | <ol style="list-style-type: none"> <li>5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</li> <li>6. <input type="checkbox"/> Interview Summary (PTO-413),<br/>Paper No./Mail Date _____</li> <li>7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment</li> <li>8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance</li> <li>9. <input type="checkbox"/> Other _____</li> </ol> |
|---|---|

  
**GEORGE ENG**  
**PRIMARY EXAMINER**

## EXAMINER'S AMENDMENTS AND STATEMENT OF REASONS FOR ALLOWANCE

### *Examiner's Amendment*

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jian Ma (Reg. No. 48,820) on 6/8/2005.

2. The application has been amended as follows:

1. (Currently Amended) In a wireless communications system wherein an equalizer is used to reduce interference on a communications channel, [and] wherein a Doppler frequency is reflective of a rate of change of the communications channel, and wherein the equalizer comprises a main tap, a first number of causal taps, and a second number of anti-causal taps, a method for adjusting a length of the equalizer comprising increasing the length as the Doppler frequency decreases, and decreasing the length as the Doppler frequency increases, [wherein the equalizer comprises a main tap, a first number of causal taps, and a second number of anti-causal taps, and] wherein said increasing comprises determining whether said causal taps are more useful than said anti-causal taps, and if so, increasing said first numbers, and if not, increasing said second number.

Art Unit: 2643

25. (Currently Amended) An equalizer for reducing interference on a wireless communications channel, wherein a Doppler frequency is reflective of a rate of change of the wireless communications channel, said equalizer comprising:

a main tap;

a first number of causal taps;

a second number of anti-causal taps; [and]

means for selecting said first and second number based on the Doppler frequency;

means for initializing said first number and said second number using a first estimate of the Doppler frequency;

means for adjusting said first number and said second number using a second estimate of the Doppler frequency subsequent to said first estimate;

means for [determining whether] decreasing said length, if said second estimate exceeds said first estimate by an amount satisfying a first thresholds[, and if so, decreasing said length];  
and

means for [determining whether] increasing said length, if said second estimate is less than said first estimate by an amount satisfying a second threshold[, and if so, increasing said lengths],

wherein said means for decreasing comprises means for determining whether said causal taps are more useful than said anti-causal taps, and if so, decreasing said second number, and if not, decreasing said first number.

***Examiner's Statement of Reasons for Allowance***

3. Claims 1, 3-9, 11, 14-25, 27, 28 and 31-35 are allowed.

4. The following is an examiner's statement of reasons for allowance:

Applicant's invention is drawn to an adaptive equalizer capable of effectively reducing ISI in those environments where the rate change of the channel varies over time in order to achieve a better compromise between the competing goals of adaptation speed and minimizing means square error (i.e., the adaptive equalizer operable for suppressing the effects of noise and interference by adjusting the equalizer length by adding or dropping either causal or anti-causal taps based on an estimate of the Doppler frequency between the devices communicating over the channel and the most recent value of the equalizer coefficients).

Applicant's independent claims 25 and 34 each recite, *inter alia*, an equalizer for reducing interference on a wireless communication channel with a structure as defined in the specification (pages 8-18) including a main tap, a first number of causal taps, a second number of anti-causal taps, means for adjusting the first number and the second number using a second estimate of the Doppler frequency subsequent to said first estimate, wherein said means for decreasing comprises means for determining whether said causal taps are more useful than said anti-causal taps, and if so, decreasing said second number, and if not, decreasing said first number, or said means for increasing comprises means for determining whether said causal taps are more useful than said anti-causal taps, and if so, increasing said second number, and if not, increasing said first number. Applicant's claims 25 and 34 comprise a particular combination of element, which are neither taught nor suggested by the prior art.

Applicant's independent method claims 1 and 8 each recite, *inter alia*, a method for adjusting a length of an equalizer in a wireless communication, wherein the equalizer is used to reduce interference on a communication, and wherein the equalizer comprises a main tap, a first number of causal taps, and a second number of anti-causal taps, the method comprising the steps of increasing the length as the Doppler frequency decreases, and decreasing the length as the Doppler frequency increases, wherein said increasing step comprises determining whether said causal taps are more useful than said anti-causal taps, and if so, increasing said first numbers, and if not, increasing said second number. These steps, in combination of the remaining steps, are neither taught nor suggested by the prior art.

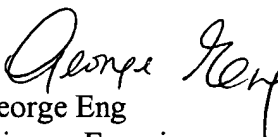
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Eng whose telephone number is (571) 272-7495. The examiner can normally be reached on Tue-Fri 7:30 AM-6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A. Kuntz can be reached on (571) 272-7499. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2643

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
George Eng  
Primary Examiner  
Art Unit 2643